

Amendments to the Specification

Please replace the paragraph on Page 5, lines 1 - 13 with the following marked-up replacement paragraph:

-- Commonly-assigned and co-pending U. S. Patent application 09/790,104 (filed on Feb. 21, 2001; now U. S. Patent 7,000,834), titled "Method To Address Security And Privacy Issues of the Use of RFID Systems to Track Consumer Products" (attorney docket RSW920000178US1, hereinafter referred to as "the first related invention" and hereby incorporated herein by reference) discloses overwriting an RFID tag's memory with new data, such as a shortened version of the product's serial number, at a point of sale to signify that the tagged item has been paid for. This patent application also discloses formatting the data memory on an RFID tag with control bits, thereby providing a type field to dictate access control such as whether a field can be overwritten. According to preferred embodiments of this first related invention, logic invoked when an update of the data memory is requested checks the associated control field, and if updating is not allowed, the logic exits rather than performing the update. Using the disclosed techniques, an unscrupulous store employee can be prevented from reprogramming the RFID tag of an expensive item with data representing an inexpensive item in order to pay a lower price for the expensive item. --

Please replace the paragraph that begins on Page 12, line 13 and carries over to Page 13, line 6 with the following marked-up replacement paragraph:

-- Preferred embodiments write the ownership data, secured with public key encryption techniques, onto a non-volatile memory on the RFID tag of a product using a read/write RFID

Serial No. 10/718,942

-2-

RSW920030240US1

transponder, although traditional indelible marking techniques such as engraving, bar codes, 2-dimensional or matrix codes could also be used advantageously for writing this secured ownership data. Alternative embodiments write the secured ownership data on existing products that already contain data memories and input/output capabilities, such as computers and peripherals, pervasive computing devices, consumer electronics, and appliances. (Commonly-assigned and co-pending U. S. Patent _____, entitled "Methods, Systems and Computer Program Products for Secure Firmware Updates", and U. S. Patent _____, entitled Patent 6,976,163, entitled "Methods, Systems and Computer Program Products for Rule Based Firmware Updates Utilizing Certificate Extensions and Certificates for Use Therein", disclose techniques for creating a secure memory within the flash memory of computing devices, consumer electronics, and appliances. The teachings in these commonly-assigned inventions, which were filed on July 12, 2000 and have serial numbers 09/614,982 and 09/614,983, respectively, may be leveraged by alternative embodiments which write ownership data into products containing data memory.) —

Please replace the paragraph on Page 13, lines 9 - 13 with the following marked-up replacement paragraph:

-- Each party in the chain of ownership for a product has incentives to keep accurate records concerning that party's acquisition and disposition of the product. Some of these incentives arise because of the possibility of a product liability ~~[[suit]]~~ lawsuit. A consumer would like to be able to prove everyone who has previously owned the product, for example, and anyone who once owned the product would like to be able to prove that ownership was

Serial No. 10/718,942

-3-

RSW920030240US1

transferred, to whom, and when. --

Please replace the paragraph on Page 15, lines 8 - 19 with the following marked-up replacement paragraph:

-- Fig. 3A illustrates a first sample format for an ownership transfer record 300 to be stored on a product (where this format is best suited to a device without severe space constraints). As shown therein, an optional product-specific description 310 (such as the manufacturer's model number) may be recorded (preferably as the first entry) in the product's ownership transfer record. Some number of GUIDs 320 are present in the record, each corresponding to a previous transfer, thereby providing a history of product transfers. In preferred embodiments, the first such GUID 321 serves as a product serial number which uniquely identifies the product. Using a GUID (such as the product serial number, or alternatively one of the transaction-specific GUIDs illustrated at reference numbers 322 - ~~[[326]]~~ 325 and 331) as an index for ownership transfer records within the audit registry thereby uniquely identifies the product associated with each such record. (The serial number 321 is preferably created when the ownership transfer record 300 is initialized, as exemplified by the logic in Figs. 6 and 7, which are described below.) --

Please replace the paragraph that begins on Page 18, line 19 and carries over to Page 19, line 11 with the following marked-up replacement paragraph:

-- In an embodiment where the product-integral ownership information is recorded indelibly using bar codes, matrix codes, indelible ink or other physical markings (rather than an

Serial No. 10/718,942

-4-

RSW920030240US1

RFID chip or similar technology), the ownership information preferably comprises an engraved or embossed representation of the digitally-signed GUID of each transfer. Each ownership transfer, including the transfer to the current owner, thereby remains permanently on the product as a product-integral ownership transfer log. In this embodiment, a format of the type shown in Fig. 3C (where the on-product information omits details of the transaction, such as the seller and buyer IDs) will include, for each previously-recorded GUID ~~[[213]]~~ 321 - 325, the digital signature that was computed when that GUID was initially written to the product. (If a format of the type presented in Fig. 3D is used, where transaction-specific details are written to the product, then each record 320a, 320b in the product history will also include the digital signature originally computed for that transaction.) --

Please replace the paragraph on Page 21, lines 6 - 17 with the following marked-up replacement paragraph:

-- A second sample format 390 for audit records is illustrated in Fig. 3F. This format represents a scenario where the audit registrar records all information provided for the transaction (as discussed below with reference to Blocks 410 - 420 of Fig. 4 and Block 500 of Fig. 5), and corresponds to the on-product ownership record format 370 in Fig. 3D. In this approach, the audit registrar copies all of the information provided by the product, except for the previous digital signature, into a new audit record 390. (In the example in Fig. 3F, the copied fields are depicted at 310, 320a, and 320b.) The index to the new audit record is a newly-computed GUID, illustrated at reference number 391. Notably, this GUID is preferably repeated in field 395 (see reference number 396), in which details of this current transaction are recorded, such that the

Serial No. 10/718,942

-5-

RSW920030240US1

newly-computed digital signature 340 (covering all fields in audit registry record ~~[[391]]~~ 390 except the record key at 391) is identical to the digital signature in the newly-stored on-product record having record format 370. --

Please replace the paragraph that begins on Page 22, line 20 and carries over to Page 23, line 6 with the following marked-up replacement paragraph:

-- Referring now to Fig. 5, the registrar receives the ownership data and current transaction details ~~[[()]]~~ that are transmitted from the product according to Fig. 4, and in preferred embodiments, the credentials of the person purporting to be the current owner are also provided to the registrar (Block ~~500~~: 500). Credentials may be presented in a number of different ways, such as a user ID and password combination, or biometric information of the user (such as a fingerprint), etc. A trusted agent may present the credentials securely, including a programmatic process using secured network transmission. --

Please replace the paragraph on Page 24, lines 3 - 13 with the following marked-up replacement paragraph:

-- The operations of Blocks 540 - 580 begin with the registrar generating a new GUID for the new transaction that is to be registered (Block 540). At Block 550, a new ownership record is created by the registrar in preferred embodiments, using data from the previous (on-product) ownership record plus data pertaining to the pending transfer. The ownership history portion of the new ownership record preferably includes all previously-existing ownership history data (e.g., field 320 in Fig. 3A) fields from the ownership transfer record and the pertinent sub-fields from

the last-transaction information. For example, with reference to ownership record format 300 in Fig. 3A, only sub-field 331 from field 300 is used (along with field 320) when constructing the new version of ownership history field 320. When using format 370 in Fig. 3D, on the other hand, the entire contents of last transaction field 330 are used when constructing the new history field [[320.]] 320b. --

Please replace the paragraph that begins on Page 29, line 19 and carries over to Page 31, line 6 with the following marked-up replacement paragraph:

-- Note that some control over the details of an ownership transfer transaction may, in some cases, be imposed by legal restrictions on the registrar that registers transfers and/or on a registrar (or other entity) that subsequently accesses the registered information during an audit. These restrictions may arise in various ways, such as through the contractual arrangement between the selling party and the chosen registrar, and may require additional protections such as encryption of the transaction data deposited in the audit record. For example, the unit price of a transfer may be an extremely sensitive piece of information to the seller, or a driver's license number or similar identifying information used for authentication of the buyer might be quite sensitive from the buyer's perspective. Preferably, the novel techniques disclosed in several commonly-assigned and co-pending related U. S. Patent applications are leveraged to provide this type of control. These related applications (filed on 10/21/1999), which are referred to herein as "the selective XML encryption patent applications" and are hereby incorporated herein by reference, comprise the following: "Selective Data Encryption Using Style Sheet Processing" (attorney docket RSW919990073US1, serial number 09/422,430; now U. S. Patent 6,931,532);

Serial No. 10/718,942

-7-

RSW920030240US1

“Selective Data Encryption Using Style Sheet Processing For Decryption By A Client Proxy” (attorney docket RSW919990112US1, serial number 09/422,537; now U. S. Patent 6,961,849), “Selective Data Encryption Using Style Sheet Processing for Decryption by a Group Clerk” (attorney docket RSW919990111US1, serial number 09/422,492; now U. S. Patent 6,978,367); and “Selective Data Encryption Using Style Sheet Processing For Decryption By A Key Recovery Agent” (attorney docket RSW919990113US1, serial number 09/422,431; now U. S. Patent 6,941,459). Techniques disclosed in the selective XML encryption patent applications enable restricting access to portions of a document to one or more “communities” through use of community-specific encryption (where a “community” is a collection of authorized viewers of information, including humans as well as programmatic entities or processes). The selective XML patent applications also disclose techniques for enabling a key recovery agent to decrypt portions of a document on behalf of a community member that is properly authenticated to the key recovery agent. Embodiments of the present invention preferably leverage techniques disclosed in these related applications to represent transaction data in a way that restricts access to contained field data to selective sets of viewers, and also to enable decryption by a key recovery agent (which could be used, for example, to allow access by governmental agencies under legally-required situations). —

Please replace the paragraph that begins on Page 31, line 9 and carries over to Page 32, line 4 with the following marked-up replacement paragraph:

— Fig. 8 illustrates how, for the special case of a merchant who re-brands a generic product, the first ownership transfer transaction that forms part of ownership transfer record

Serial No. 10/718,942

-8-

RSW920030240US1

(such as format 300 in Fig. 3A) can be used to represent the true origin of the generic item. This allows traceability back to the original manufacturer, as is desirable (*inter alia*) in a product-liability situation. The sub-fields within the last transaction field 330 are preferably used to initially record this information, and thus record 800 of Fig. 8 shows how the content of those sub-fields of format 300 is altered for this re-branding transfer situation. In particular, the GUID 831 is denoted an "original GUID" that corresponds to this transfer; the seller ID sub-field 832 is used to specify an identifier of the original manufacturer; the buyer ID sub-field 833 specifies an identifier identifying of the merchant receiving the product for re-branding; the [[data]] date and time 834 represent this transfer; and the price sub-field 835 specifies the original price paid by the re-branding merchant. Note that this information will also be stored as the first record 320a within the transaction history field when using a record format as exemplified at reference number 370 in Fig. 3D, and regardless of the format of ownership transfer records, the format of the information for the re-branding transfer is preferably identical to the format used for all other transfer transactions. --

Please replace the paragraph on Page 32, lines 5 - 18 with the following marked-up replacement paragraph:

-- Figs. 9 and 10 depict how a transfer of ownership via a network-connected scanning device can readily be carried out, for example in a manufacturing, wholesale, or retail situation. As shown therein, a product 900 passes by the scanning device 910, such that the product's ownership transfer data from its RFID chip is presented to the scanning device (Block 1000). A transaction generator component 920 leveraged by the scanning device generates a new GUID

Serial No. 10/718,942

-9-

RSW920030240US1

and new values of the sub-fields of the last transaction field to reflect this transaction (Block 1010), along with a digital signature, preferably in the manner which has been described above. Data registering the transaction is written to a log 930 (Block 1040), and the revised product ownership transfer data is provided to an RFID updater component 940 (Block 1020) which records that information in the read/write RFID chip of product 900 (Block 1030). The RFID updater component 940 is shown outside of the RFID chip 900 for drafting convenience; as will be obvious, the updater component 940 is part of the componentry on the chip of product 900. (Note that the writing of information to a log, also referred to herein as an audit repository, may occur concurrently with the returning of information to the product.) --

Please replace the paragraph that begins on Page 34, line 14 and carries over to Page 35, line 11 with the following marked-up replacement paragraph:

-- As an alternative to in-person presentation of a product to a transfer agent, the transfer agent function may be provided by a web service by proxy. For example, an online web site specializing in barter and auction transactions (such as the well-known eBay® online auction service) or a financial services provider (such as the well-known PayPal® online payment service) might be a logical place for providing this type of transfer service. ("eBay" and "PayPal" are registered trademarks of eBay Inc. and PayPal, Inc., respectively.) When using a proxy, proof of identity is preferably provided to the online proxy using conventional means. This is illustrated in Fig. 12. As can be seen by inspection, operations used in Fig. 12 are similar to those of Fig. 11, except that the ownership transfer agent proxy is accessed (Block 1210), and the seller is then authenticated to this agent (Block 1220). Preferably, the proxy then validates

Serial No. 10/718,942

-10-

RSW920030240US1

the existing ownership data using its digital signature (Block 1230) to increase its assurance that the ownership-recorded record which has been provided from the product (at Block 1200) is legitimate. If this validation succeeds, the operations of Blocks 1240 - 1290, which are analogous to Blocks 1120 - 1170 of Fig. 11, are carried out. Otherwise, error handling (not shown in Fig. 12) is preferably performed, which may include notifying an online service provider that one of its users attempted a potentially-fraudulent transfer and/or notifying authorities of a potentially-stolen product. --

Please replace the paragraph that begins on Page 40, line 7 and carries over to Page 41, line 4 with the following marked-up replacement paragraph:

-- A set of commonly-owned and co-pending U. S. Patent applications provides several techniques to detect shoplifting at a store exit, using a combination of RFID tags on merchandise, data written to RFID tags at the point of sale, and other identifiers. See the U. S. Patent Applications titled "Using RFID to Detect and/or Prevent Theft and Shoplifting" (attorney docket RSW920030126US1, serial number 10/665,282; now U. S. Patent 7,005,988), "Using Radio Frequency Identification with Customer Loyalty Cards to Detect and/or Prevent Theft and Shoplifting" (attorney docket RSW920030194US1, serial number 10/666,483), "Using Radio Frequency Identification with Transaction-Specific Correlator Values Written on Transaction Receipts to Detect and/or Prevent Theft and Shoplifting" (attorney docket RSW920030195US1, serial number 10/666,703), "Using Radio Frequency Identification with Transaction-Specific Correlator Values to Detect and/or Prevent Theft and Shoplifting" (attorney docket RSW920030196US1, serial number 10/666,287), and "Using Radio Frequency Identification

Serial No. 10/718,942

-11-

RSW920030240US1

with Transaction Receipts to Detect and/or Prevent Theft and Shoplifting" (attorney docket RSW920030197US1, serial number 10/666,700). In some embodiments, techniques disclosed in these patent applications write data, which may be a correlator containing a transaction ID, date/timestamp, sequence number, customer number, etc., to an RFID tag on merchandise at the point of sale. This is quite distinct from the present invention, which writes a non-repudiable ownership transfer log directly onto the merchandise using a variety of techniques which include, but are not limited to, RFID. --

Please replace the paragraph on Page 41, lines 5 - 11 with the following marked-up replacement paragraph:

-- A commonly-assigned and co-pending U. S. Patent Application titled "Electronic Receipt Management" (attorney docket RSW920030124US1, filed Sept. 16, 2003, serial-number ~~10/~~ 10/663,509) replaces a traditional paper receipt with an electronic receipt that is loaded into the purchaser's pervasive computing device, making it easier for a consumer to find the relevant receipt. This patent application, however, does not teach recording ownership transfers in RFID tags as disclosed herein, nor does it teach other techniques of the present invention such as creation of auditable trails of ownership transfers. --

Please replace the paragraph that begins on Page 41, line 12 and carries over to Page 42, line 1 with the following marked-up replacement paragraph:

-- Commonly-assigned, co-pending U. S. Patent Application 09/847,889 (attorney docket RSW920010017US1, filed 05/03/2001), titled "Identification and Tracking of Persons Using

Serial No. 10/718,942

-12-

RSW920030240US1

RFID-Tagged Items”, discloses techniques for using RFID technology to identify or characterize people, based on the RFID tags present in items being carried by that person at a point in time. Commonly-assigned, co-pending U. S. Patent Application 10/612,251 (attorney docket RSW920030099US1, filed 07/02/2003; now U. S. Patent 6,992,574), titled “Object Matching via RFID”, discloses techniques for using RFID technology to track and match objects, when the RFID tags of these objects have been programmed with data suitable for indicating that the items are in association with one another. Neither of these patent applications teach registering product ownership transactions or recording such information in an RFID tag. --

Serial No. 10/718,942

-13-

RSW920030240US1